

AFRER FINAL - EXPEDITED PROCEDURE

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

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Applicant(s): Gary M. Moore

Assignee: Moore Epitaxial Inc.

Title: METHOD OF CONTROLLING GAS FLOW TO A SEMICONDUCTOR  
PROCESSING REACTOR

Serial No.: 09/765,919

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Group Art 1762  
Unit:

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Monterey, CA  
March 3, 2003

CLEAN COPY OF REPLACEMENT CLAIMS

Replace the pending set of claims in the above application with the following set of claims:

12. A method comprising:

opening a first gas manifold inlet valve coupled between a first regulator and a gas manifold;

regulating a flow rate of a flow of a first process gas through said first gas manifold inlet valve to said gas manifold with said first regulator;

opening a second gas manifold inlet valve coupled between a second regulator and said gas manifold; and

regulating a flow rate of a flow of a second process gas through said second gas manifold inlet valve to said gas manifold with said second regulator, wherein said first process gas and said second process gas mix in said gas manifold.

13. The method of Claim 12 wherein said gas manifold is coupled to a reactor.

14. The method of Claim 13 wherein a mixture of said first process gas and said second process gas is supplied from said gas manifold to said reactor.

GUNNISON, McKAY &  
HODGSON, L.L.P.  
Garden West Office Plaza, Suite 220  
1900 Garden Road  
Monterey, CA 93940  
(831) 655-0880  
Fax (831) 655-0888

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15. The method of Claim 14 further comprising forming a layer on a substrate in said reactor by contacting said gas mixture with said substrate.

16. The method of Claim 12 further comprising:  
opening a gas manifold exhaust valve coupled between a third regulator and an exhaust; and  
regulating a flow rate of a flow of a third process gas through said gas manifold exhaust valve to said exhaust with said third regulator.

17. The method of Claim 16 wherein said regulating a flow rate of a flow of a third process gas occurs during said regulating a flow rate of a flow of a first process gas and said regulating a flow rate of a flow of a second process gas.

18. The method of Claim 17 further comprising:  
closing said first gas manifold inlet valve and said second gas manifold inlet valve to stop said flow of said first process gas and said flow of said second process gas to said gas manifold; and  
redirecting said flow of said third process gas from said exhaust to said gas manifold.

19. The method of Claim 18 wherein said redirecting comprises;  
closing said gas manifold exhaust valve; and  
opening a third gas manifold inlet valve coupled between said third regulator and said gas manifold.

20. The method of Claim 12 wherein said first process gas is supplied from a first process gas source and wherein said second process gas is supplied from a second process gas source, said first process gas source and said second process gas source being in a gas cabinet, said first gas manifold

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inlet valve and said second gas manifold inlet valve being located at a support structure separate from said gas cabinet.

21. A method comprising:

opening a first gas manifold inlet valve coupled between a first regulator and a gas manifold;

regulating a flow rate of a flow of a first process gas through said first gas manifold inlet valve to said gas manifold with said first regulator;

opening a gas manifold exhaust valve coupled between a second regulator and an exhaust;

regulating a flow rate of a flow of a second process gas through said gas manifold exhaust valve to said exhaust with said second regulator, said regulating a flow rate of a flow of a second process gas occurring during said regulating a flow rate of a flow of a first process gas.

29. (AMENDED) A method comprising:

setting a first flow rate of a flow of a first gas to a mixer;

setting a second flow rate of a flow of a second gas to said mixer, wherein a first flow of a gas mixture comprising said first gas and said second gas exits said mixer, said first flow of said gas mixture having a third flow rate;

setting a fourth flow rate of a second flow of said gas mixture to a reactor; and

directing said second flow of said gas mixture to said reactor, said second flow being a first portion of said first flow of said gas mixture exiting said mixer.

30. (AMENDED) The method of Claim 29 further comprising directing a third flow of said gas mixture to an exhaust, said third flow of said gas mixture having a fifth flow rate equal to a difference between said third flow rate and said second flow rate, said third flow being a second portion of said first flow of said gas mixture exiting said mixer.

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31. The method of Claim 29 wherein said first gas is a dopant gas and wherein said second gas is a carrier gas.

32. (AMENDED) A method comprising:  
setting a flow rate of a flow of a dopant gas to a mixer;  
setting a flow rate of a flow of a carrier gas to said mixer, wherein said dopant gas and said carrier gas mix in said mixer to form a process gas which flows out of said mixer; and

setting a flow rate of a first flow of said process gas to a reactor, wherein a difference between said flow of said process gas out of said mixer and said first flow of said process gas to said reactor is excess process gas, said first flow of said process gas and said excess process gas being portions of said flow of said process gas out of said mixer.

33. The method of Claim 32 further comprising sending said excess process gas to an exhaust past a check valve.

34. The method of Claim 33 wherein a flow of said excess process gas to said exhaust has a flow rate equal to a difference between a flow rate of said flow of said process gas out of said mixer and said flow rate of said first flow of said process gas to said reactor.

35. A method comprising:  
opening a first gas manifold inlet valve coupled between a first regulator and a gas manifold;  
regulating a flow rate of a flow of a first process gas through said first gas manifold inlet valve to said gas manifold with said first regulator;  
opening a second gas manifold inlet valve coupled between a second regulator and said gas manifold;

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regulating a flow rate of a flow of a second process gas through said second gas manifold inlet valve to said gas manifold with said second regulator;

opening a gas manifold exhaust valve coupled between a third regulator and an exhaust; and

regulating a flow rate of a flow of a third process gas through said gas manifold exhaust valve to said exhaust with said third regulator during said regulating a flow rate of a flow of a first process gas and said regulating a flow rate of a flow of a second process gas.

36. A method comprising:

opening a first gas manifold inlet valve coupled between a first regulator and a gas manifold;

regulating a flow rate of a flow of a first process gas through said first gas manifold inlet valve to said gas manifold with said first regulator;

opening a second gas manifold inlet valve coupled between a second regulator and said gas manifold;

regulating a flow rate of a flow of a second process gas through said second gas manifold inlet valve to said gas manifold with said second regulator;

opening a gas manifold exhaust valve coupled between a third regulator and an exhaust;

regulating a flow rate of a flow of a third process gas through said gas manifold exhaust valve to said exhaust with said third regulator during said regulating a flow rate of a flow of a first process gas and said regulating a flow rate of a flow of a second process gas;

closing said first gas manifold inlet valve and said second gas manifold inlet valve to stop said flow of said first process gas and said flow of said second process gas to said gas manifold; and

redirecting said flow of said third process gas from said exhaust to said gas manifold.

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37. The method of Claim 36 wherein said redirecting comprises;

closing said gas manifold exhaust valve; and  
opening a third gas manifold inlet valve coupled between said third regulator and said gas manifold.

38. A method comprising:

opening a first gas manifold inlet valve coupled between a first regulator and a gas manifold;

regulating a flow rate of a flow of a first process gas through said first gas manifold inlet valve to said gas manifold with said first regulator;

opening a gas manifold exhaust valve coupled between a second regulator and an exhaust;

regulating a flow rate of a flow of a second process gas through said gas manifold exhaust valve to said exhaust with said second regulator, said regulating a flow rate of a flow of a second process gas occurring during said regulating a flow rate of a flow of a first process gas;

closing said first gas manifold inlet valve to stop said flow of said first process gas to said gas manifold; and

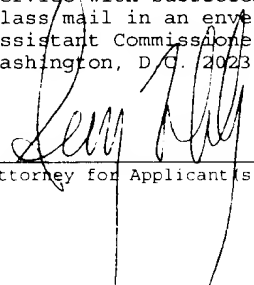
redirecting said flow of said second process gas from said exhaust to said gas manifold comprising:

closing said gas manifold exhaust valve; and

opening a second gas manifold inlet valve coupled between said second regulator and said gas manifold.

### CERTIFICATE OF MAILING

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Attorney for Applicant(s)

March 3, 2003  
\_\_\_\_\_  
Date of Signature

GUNNISON, McKAY &  
HODGSON, L.L.P.  
Garden West Office Plaza, Suite 220  
1900 Garden Road  
Monterey, CA 93940  
(831) 655-0880  
Fax: (831) 655-0888